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SEP 26 2002



TECH CENTER 1600/2900

1600

P#25

RAW SEQUENCE LISTING

DATE: 09/24/2002

PATENT APPLICATION: US/09/461,580B

TIME: 13:40:35

Input Set : N:\Crf4\09192002\I461580.raw

Output Set: N:\CRF4\09242002\I461580B.raw

```

1 <110> APPLICANT: Guarente, Leonard
2   Imai, Shin-ichiro
3   Armstrong, Christopher
4 <120> TITLE OF INVENTION: METHODS FOR IDENTIFYING AGENTS WHICH ALTER HISTINE
5   PROTEIN ACETYLATION, DECREASE AGING, INCREASE LIFESPAN
6 <130> FILE REFERENCE: 13407-016001
7 <140> CURRENT APPLICATION NUMBER: US/09/461,580B
8 <141> CURRENT FILING DATE: 1999-12-15
9 <160> NUMBER OF SEQ ID NOS: 37
10 <170> SOFTWARE: FastSEQ for Windows Version 4.0
12 <210> SEQ ID NO: 1
13 <211> LENGTH: 737
14 <212> TYPE: PRT
15 <213> ORGANISM: Mus musculus
16 <400> SEQUENCE: 1
17   Met Ala Asp Glu Val Ala Leu Ala Leu Gln Ala Ala Gly Ser Pro Ser
18       1           5           10           15
19   Ala Ala Ala Ala Met Glu Ala Ala Ser Gln Pro Ala Asp Glu Pro Leu
20       20           25           30
21   Arg Lys Arg Pro Arg Arg Asp Gly Pro Gly Leu Gly Arg Ser Pro Gly
22       35           40           45
23   Glu Pro Ser Ala Ala Val Ala Pro Ala Ala Ala Gly Cys Glu Ala Ala
24       50           55           60
25   Ser Ala Ala Ala Pro Ala Ala Leu Trp Arg Glu Ala Ala Gly Ala Ala
26       65           70           75           80
27   Ala Ser Ala Glu Arg Glu Ala Pro Ala Thr Ala Val Ala Gly Asp Gly
28       85           90           95
29   Asp Asn Gly Ser Gly Leu Arg Arg Glu Pro Arg Ala Ala Asp Asp Phe
30       100          105          110
31   Asp Asp Asp Glu Gly Glu Glu Glu Asp Glu Ala Ala Ala Ala Ala Ala
32       115          120          125
33   Ala Ala Ala Ile Gly Tyr Arg Asp Asn Leu Leu Leu Thr Asp Gly Leu
34       130          135          140
35   Leu Thr Asn Gly Phe His Ser Cys Glu Ser Asp Asp Asp Asp Arg Thr
36       145          150          155          160
37   Ser His Ala Ser Ser Ser Asp Trp Thr Pro Arg Pro Arg Ile Gly Pro
38       165          170          175
39   Tyr Thr Phe Val Gln Gln His Leu Met Ile Gly Thr Asp Pro Arg Thr
40       180          185          190
41   Ile Leu Lys Asp Leu Leu Pro Glu Thr Ile Pro Pro Pro Glu Leu Asp
42       195          200          205
43   Asp Met Thr Leu Trp Gln Ile Val Ile Asn Ile Leu Ser Glu Pro Pro
44       210          215          220

```

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Output Set: N:\CRF4\09242002\I461580B.raw

```

45  Lys Arg Lys Lys Arg Lys Asp Ile Asn Thr Ile Glu Asp Ala Val Lys
46  225                               230                               235                               240
47  Leu Leu Gln Glu Cys Lys Lys Ile Ile Val Leu Thr Gly Ala Gly Val
48                               245                               250                               255
49  Ser Val Ser Cys Gly Ile Pro Asp Phe Arg Ser Arg Asp Gly Ile Tyr
50                               260                               265                               270
51  Ala Arg Leu Ala Val Asp Phe Pro Asp Leu Pro Asp Pro Gln Ala Met
52                               275                               280                               285
53  Phe Asp Ile Glu Tyr Phe Arg Lys Asp Pro Arg Pro Phe Phe Lys Phe
54                               290                               295                               300
55  Ala Lys Glu Ile Tyr Pro Gly Gln Phe Gln Pro Ser Leu Cys His Lys
56  305                               310                               315                               320
57  Phe Ile Ala Leu Ser Asp Lys Glu Gly Lys Leu Leu Arg Asn Tyr Thr
58                               325                               330                               335
59  Gln Asn Ile Asp Thr Leu Glu Gln Val Ala Gly Ile Gln Arg Ile Leu
60                               340                               345                               350
61  Gln Cys His Gly Ser Phe Ala Thr Ala Ser Cys Leu Ile Cys Lys Tyr
62                               355                               360                               365
63  Lys Val Asp Cys Glu Ala Val Arg Gly Asp Ile Phe Asn Gln Val Val
64  370                               375                               380
65  Pro Arg Cys Pro Arg Cys Pro Ala Asp Glu Pro Leu Ala Ile Met Lys
66  385                               390                               395                               400
67  Pro Glu Ile Val Phe Phe Gly Glu Asn Leu Pro Glu Gln Phe His Arg
68                               405                               410                               415
69  Ala Met Lys Tyr Asp Lys Asp Glu Val Asp Leu Leu Ile Val Ile Gly
70                               420                               425                               430
71  Ser Ser Leu Lys Val Arg Pro Val Ala Leu Ile Pro Ser Ser Ile Pro
72  435                               440                               445
73  His Glu Val Pro Gln Ile Leu Ile Asn Arg Glu Pro Leu Pro His Leu
74  450                               455                               460
75  His Phe Asp Val Glu Leu Leu Gly Asp Cys Asp Val Ile Ile Asn Glu
76  465                               470                               475                               480
77  Leu Cys His Arg Leu Gly Gly Glu Tyr Ala Lys Leu Cys Cys Asn Pro
78                               485                               490                               495
79  Val Lys Leu Ser Glu Ile Thr Glu Lys Pro Pro Arg Pro Gln Lys Glu
80                               500                               505                               510
81  Leu Val His Leu Ser Glu Leu Pro Pro Thr Pro Leu His Ile Ser Glu
82  515                               520                               525
83  Asp Ser Ser Ser Pro Glu Arg Thr Val Pro Gln Asp Ser Ser Val Ile
84  530                               535                               540
85  Ala Thr Leu Val Asp Gln Ala Thr Asn Asn Asn Val Asn Asp Leu Glu
86  545                               550                               555                               560
87  Val Ser Glu Ser Ser Cys Val Glu Glu Lys Pro Gln Glu Val Gln Thr
88                               565                               570                               575
89  Ser Arg Asn Val Glu Asn Ile Asn Val Glu Asn Pro Asp Phe Lys Ala
90  580                               585                               590
91  Val Gly Ser Ser Thr Ala Asp Lys Asn Glu Arg Thr Ser Val Ala Glu
92  595                               600                               605
93  Thr Val Arg Lys Cys Trp Pro Asn Arg Leu Ala Lys Glu Gln Ile Ser

```

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Input Set : N:\Crf4\09192002\I461580.raw

Output Set: N:\CRF4\09242002\I461580B.raw

```

94          610          615          620
95  Lys Arg Leu Glu Gly Asn Gln Tyr Leu Phe Val Pro Pro Asn Arg Tyr
96  625          630          635          640
97  Ile Phe His Gly Ala Glu Val Tyr Ser Asp Ser Glu Asp Asp Val Leu
98          645          650          655
99  Ser Ser Ser Ser Cys Gly Ser Asn Ser Asp Ser Gly Thr Cys Gln Ser
100          660          665          670
101  Pro Ser Leu Glu Glu Pro Leu Glu Asp Glu Ser Glu Ile Glu Glu Phe
102          675          680          685
103  Tyr Asn Gly Leu Glu Asp Asp Thr Glu Arg Pro Glu Cys Ala Gly Gly
104          690          695          700
105  Ser Gly Phe Gly Ala Asp Gly Gly Asp Gln Glu Val Val Asn Glu Ala
106          705          710          715          720
107  Ile Ala Thr Arg Gln Glu Leu Thr Asp Val Asn Tyr Pro Ser Asp Lys
108          725          730          735
109  Ser
111 <210> SEQ ID NO: 2
112 <211> LENGTH: 272
113 <212> TYPE: PRT
114 <213> ORGANISM: Saccharomyces cerevisiae
115 <400> SEQUENCE: 2
116  Ile Asn Lys Val Leu Cys Thr Arg Leu Arg Leu Ser Asn Phe Phe Thr
117    1          5          10          15
118  Ile Asp His Phe Ile Gln Lys Leu His Thr Ala Arg Lys Ile Leu Val
119          20          25          30
120  Leu Thr Gly Ala Gly Val Ser Thr Ser Leu Gly Ile Pro Asp Phe Arg
121          35          40          45
122  Ser Ser Glu Gly Phe Tyr Ser Lys Ile Lys His Leu Gly Leu Asp Asp
123          50          55          60
124  Pro Gln Asp Val Phe Asn Tyr Asn Ile Phe Met His Asp Pro Ser Val
125          65          70          75          80
126  Phe Tyr Asn Ile Ala Asn Met Val Leu Pro Pro Glu Lys Ile Tyr Ser
127          85          90          95
128  Pro Leu His Ser Phe Ile Lys Met Leu Gln Met Lys Gly Lys Leu Leu
129          100          105          110
130  Arg Asn Tyr Thr Gln Asn Ile Asp Asn Leu Glu Ser Tyr Ala Gly Ile
131          115          120          125
132  Ser Thr Asp Lys Leu Val Gln Cys His Gly Ser Phe Ala Thr Ala Thr
133          130          135          140
134  Cys Val Thr Cys His Trp Asn Leu Pro Gly Glu Arg Ile Phe Asn Lys
135          145          150          155          160
136  Ile Arg Asn Leu Glu Leu Pro Leu Cys Pro Tyr Cys Tyr Lys Lys Arg
137          165          170          175
138  Arg Glu Tyr Phe Pro Glu Gly Tyr Asn Asn Lys Val Gly Val Ala Ala
139          180          185          190
140  Ser Gln Gly Ser Met Ser Glu Arg Pro Pro Tyr Ile Leu Asn Ser Tyr
141          195          200          205
142  Gly Val Leu Lys Pro Asp Ile Thr Phe Phe Gly Glu Ala Leu Pro Asn
143          210          215          220

```

## RAW SEQUENCE LISTING

DATE: 09/24/2002

PATENT APPLICATION: US/09/461,580B

TIME: 13:40:35

Input Set : N:\Crf4\09192002\I461580.raw

Output Set: N:\CRF4\09242002\I461580B.raw

```

144      Lys Phe His Lys Ser Ile Arg Glu Asp Ile Leu Glu Cys Asp Leu Leu
145      225                               230                               235                               240
146      Ile Cys Ile Gly Thr Ser Leu Lys Val Ala Pro Val Ser Glu Ile Val
147                               245                               250                               255
148      Asn Met Val Pro Ser His Val Pro Gln Val Leu Ile Asn Arg Asp Pro
149                               260                               265                               270
151 <210> SEQ ID NO: 3
152 <211> LENGTH: 267
153 <212> TYPE: PRT
154 <213> ORGANISM: Saccharomyces cerevisiae
155 <400> SEQUENCE: 3
156      Ile Asn Lys Val Leu Ser Thr Arg Leu Arg Leu Pro Asn Phe Asn Thr
157      1                               5                               10                               15
158      Ile Asp His Phe Thr Ala Thr Leu Arg Asn Ala Lys Lys Ile Leu Val
159                               20                               25                               30
160      Leu Thr Gly Ala Gly Val Ser Thr Ser Leu Gly Ile Pro Asp Phe Arg
161      35                               40                               45
162      Ser Ser Glu Gly Phe Tyr Ser Lys Ile Arg His Leu Gly Leu Glu Asp
163      50                               55                               60
164      Pro Gln Asp Val Phe Asn Leu Asp Ile Phe Leu Gln Asp Pro Ser Val
165      65                               70                               75                               80
166      Phe Tyr Asn Ile Ala His Met Val Leu Pro Pro Glu Asn Met Tyr Ser
167                               85                               90                               95
168      Pro Leu His Ser Phe Ile Lys Met Leu Gln Asp Lys Gly Lys Leu Leu
169      100                              105                              110
170      Arg Asn Tyr Thr Gln Asn Ile Asp Asn Leu Glu Ser Tyr Ala Gly Ile
171      115                              120                              125
172      Asp Pro Asp Lys Leu Val Gln Cys His Gly Ser Phe Ala Thr Ala Ser
173      130                              135                              140
174      Cys Val Thr Cys His Trp Gln Ile Pro Gly Glu Lys Ile Phe Glu Asn
175      145                              150                              155                              160
176      Ile Arg Asn Leu Glu Leu Pro Leu Cys Pro Tyr Cys Tyr Gln Lys Arg
177                               165                               170                               175
178      Lys Gln Tyr Phe Pro Met Ser Asn Gly Asn Asn Thr Val Gln Thr Asn
179                               180                               185                               190
180      Ile Asn Phe Asn Ser Pro Ile Leu Lys Ser Tyr Gly Val Leu Lys Pro
181      195                              200                              205
182      Asp Met Thr Phe Phe Gly Glu Ala Leu Pro Ser Arg Phe His Lys Thr
183      210                              215                              220
184      Ile Arg Lys Asp Ile Leu Glu Cys Asp Leu Leu Ile Cys Ile Gly Thr
185      225                              230                              235                              240
186      Ser Leu Lys Val Ala Pro Val Ser Glu Ile Val Asn Met Val Pro Ser
187      245                              250                              255
188      His Val Pro Gln Ile Leu Ile Asn Arg Asp Met
189      260                              265
191 <210> SEQ ID NO: 4
192 <211> LENGTH: 245
193 <212> TYPE: PRT
194 <213> ORGANISM: Mus musculus

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## RAW SEQUENCE LISTING

DATE: 09/24/2002

PATENT APPLICATION: US/09/461,580B

TIME: 13:40:36

Input Set : N:\Crf4\09192002\I461580.raw

Output Set: N:\CRF4\09242002\I461580B.raw

195 &lt;400&gt; SEQUENCE: 4

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196 Val Ile Asn Ile Leu Ser Glu Pro Pro Lys Arg Lys Lys Arg Lys Asp
197 1 5 10 15
198 Ile Asn Thr Ile Glu Asp Ala Val Lys Leu Leu Gln Glu Cys Lys Lys
199 20 25 30
200 Ile Ile Val Leu Thr Gly Ala Gly Val Ser Val Ser Cys Gly Ile Pro
201 35 40 45
202 Asp Phe Arg Ser Arg Asp Gly Ile Tyr Ala Arg Leu Ala Val Asp Phe
203 50 55 60
204 Pro Asp Leu Pro Asp Pro Gln Ala Met Phe Asp Ile Glu Tyr Phe Arg
205 65 70 75 80
206 Lys Asp Pro Arg Pro Phe Phe Lys Phe Ala Lys Glu Ile Tyr Pro Gly
207 85 90 95
208 Gln Phe Gln Pro Ser Leu Cys His Lys Phe Ile Ala Leu Ser Asp Lys
209 100 105 110
210 Glu Gly Lys Leu Leu Arg Asn Tyr Thr Gln Asn Ile Asp Thr Leu Glu
211 115 120 125
212 Gln Val Ala Gly Ile Gln Arg Ile Leu Gln Cys His Gly Ser Phe Ala
213 130 135 140
214 Thr Ala Ser Cys Leu Ile Cys Lys Tyr Lys Val Asp Cys Glu Ala Val
215 145 150 155 160
216 Arg Gly Asp Ile Phe Asn Gln Val Val Pro Arg Cys Pro Arg Cys Pro
217 165 170 175
218 Ala Asp Glu Pro Leu Ala Ile Met Lys Pro Glu Ile Val Phe Phe Gly
219 180 185 190
220 Glu Asn Leu Pro Glu Gln Phe His Arg Ala Met Lys Tyr Asp Lys Asp
221 195 200 205
222 Glu Val Asp Leu Leu Ile Val Ile Gly Ser Ser Leu Lys Val Arg Pro
223 210 215 220
224 Val Ala Leu Ile Pro Ser Ser Ile Pro His Glu Val Pro Gln Ile Leu
225 225 230 235 240
226 Ile Asn Arg Glu Pro
227 245

```

229 &lt;210&gt; SEQ ID NO: 5

230 &lt;211&gt; LENGTH: 237

231 &lt;212&gt; TYPE: PRT

232 &lt;213&gt; ORGANISM: Salmonella typhimurium

233 &lt;400&gt; SEQUENCE: 5

```

234 Met Met Glu Asn Pro Arg Val Leu Val Leu Thr Gly Ala Gly Ile Ser
235 1 5 10 15
236 Ala Glu Ser Gly Ile Arg Thr Phe Arg Ala Ala Asp Gly Leu Trp Glu
237 20 25 30
238 Glu His Arg Val Glu Asp Val Ala Thr Pro Glu Gly Phe Ala Arg Asn
239 35 40 45
240 Pro Gly Leu Val Gln Thr Phe Tyr Asn Ala Arg Arg Gln Gln Leu Gln
241 50 55 60
242 Gln Pro Glu Ile Gln Pro Asn Ala Ala His Leu Ala Leu Ala Asn Leu
243 65 70 75 80
244 Lys Lys Arg Leu Ala Ile Ala Phe Leu Leu Val Thr Gln Asn Ile Asp

```

RAW SEQUENCE LISTING ERROR SUMMARY      DATE: 09/24/2002  
PATENT APPLICATION: US/09/461,580B      TIME: 13:40:37

Input Set : N:\Crf4\09192002\I461580.raw  
Output Set: N:\CRF4\09242002\I461580B.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:27; Xaa Pos. 8

## VERIFICATION SUMMARY

DATE: 09/24/2002

PATENT APPLICATION: US/09/461,580B

TIME: 13:40:37

Input Set : N:\Crf4\09192002\I461580.raw

Output Set: N:\CRF4\09242002\I461580B.raw

L:977 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:27 after pos.:0